```
// MainActivity.java ; Noah Spenser; Senior Design; Diabetic Breathalyzer

package com.noahspenser.seniordesign;
import android.os.Parcel;
import android.os.Parcelable;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.bluetooth.*;
import android.util.Log;
import android.view.View;
import java.util.*;
import android.widget.*;
import java.io.IOException;
import android.os.Handler;
import android.content.Intent;
import java.io.*;
import java.util.ArrayList;
import java.util.Date;
public class MainActivity extends AppCompatActivity {
   public static ArrayList<Reading> valueList;
   public static boolean createflag=false;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      Intent ia;
      float newreading;
      if(createflag==true){
         Log.d("init2","createflag is true");
         ia=getIntent();
         newreading=ia.getFloatExtra("newReading",-1);
         if(newreading!=-1) {
            Reading nr = new Reading(newreading);
            valueList.add(nr);
            Log.d("ocma","received reading");
            saveValueList();
         }
      }
      if(createflag==false) {
         Log.d("init","createflag is false");
         valueList = new ArrayList<Reading>();
         //fakeValueList();
         instantiateValueList();
         createflag=true;
      }
      final Button button1 = (Button) findViewById(R.id.membutton);
      button1.setOnClickListener(new View.OnClickListener() {
         public void onClick(View v) {
            Intent i2=new Intent(MainActivity.this,CheckHistory.class);
            i2.putParcelableArrayListExtra("valueList",valueList);
            startActivity(i2);

         }
      });
      final Button button2 = (Button) findViewById(R.id.readbutton);
      button2.setOnClickListener(new View.OnClickListener() {
         public void onClick(View v) {
            Intent i2=new Intent(MainActivity.this,ReadFromDevice.class);
            startActivity(i2);
         }
      });
      /*final Button button3 = (Button) findViewById(R.id.settingsbutton);
```

```
        button3.setOnClickListener(new View.OnClickListener() {
            public void onClick(View v) {
                Intent i2=new Intent(MainActivity.this,CheckSettings.class);
                startActivity(i2);
            }
        });*/
    }
    void instantiateValueList(){
        Log.d("ivl","trying to instantiate");
        String a=null;
        File dir=getFilesDir();
        File newfile=new File(dir,"afasafasa.txt");
        FileReader fr;
        try{
            fr=new FileReader(newfile);
        }catch(FileNotFoundException fs){
            Log.d("ivl","filenotfound");
            valueList=new ArrayList<Reading>();
            return;
        }
        char read=0;
        int i=0;
        StringBuilder sbr=new StringBuilder();
        try{
            for(;(int)read!=-1;){
                Log.d("ivl","fullreading");
                sbr.delete(0,sbr.length());
                i=0;
                for(;i!=(int)'\r'&&i!=-1;){
                    i=fr.read();
                    read=(char)i;
                    Log.d("ivl","reading "+read);
                    sbr.append(read);
                }
                i=fr.read();
                if(sbr.toString()!=""&&sbr.length()>2) {
                    Log.d("ivl","abouttoaddreading");
                    Reading a1 = new Reading(sbr.toString());
                    valueList.add(a1);
                    Log.d("ivl","addedreading");
                }else{
                    break;
                }
            }
        }catch(IOException ioa) {
            Log.d("ivl","ioexception in create valuelist");
            return;
        }
        Log.d("ivl","abouttoclose");
        try{
            fr.close();
        }catch(IOException ioa1){
            Log.d("ivl","couldn't close");
            return;
        }
    }
    /*void fakeValueList(){
        Log.d("fvl","trying to create value list");
        String a="23.4555 27.644 Tue Nov 15 2016 16:34:50 GMT-0500 (EST)\r\n2.45 270.644 Wed Nov 16 2016
16:34:52 GMT-0500 (EST)\r\n47.55 2.644 Thu Nov 17 2016 17:35:50 GMT-0500 (EST)\r\n";
        FileWriter fw;
        File dir=getFilesDir();
```

```
        File newfile=new File(dir,"afasafasa.txt");
        try{
            newfile.createNewFile();
        }catch (IOException ioio){
            Log.d("fvl","io create new file");
            return;
        }
        int len=valueList.size();
        try{
            fw=new FileWriter(newfile);
        }catch(IOException abc){
            Log.d("fvl","IOexception in create fw");
            return;
        }
        try {
            fw.write(a);
        }catch(IOException abcd){
            Log.d("fvl","IOexception in write");
            return;
        }
        try{
            fw.flush();
            fw.close();
        }catch(IOException argh){
            Log.d("fvl","IOexception in close");
        }
    }*/
    void saveValueList(){
        FileWriter fw;
        File dir=getFilesDir();
        int len=valueList.size();
        File newfile=new File(dir,"afasafasa.txt");
        try{
            newfile.createNewFile();
            Log.d("svl","creatingfile");
        }catch (IOException ioio){
            Log.d("svl","io create new file");
        }
        try{
            fw=new FileWriter(newfile);
            Log.d("svl","creatingfilewriter");
        }catch(IOException abc){
            Log.d("svl","ioexceptioncreatingfilewriter");
            return;
        }
        try {
            for (int counter = 0; counter < len; counter++) {
                fw.write(valueList.get(counter).toString());
                Log.d("svl","writingvalue");
            }
        }catch(IOException abcd){
            Log.d("svl","ioexceptionwritingvalue");
            return;
        }
        try{
            fw.close();
            Log.d("svl","closingstream");
        }catch(IOException abdcde){
            Log.d("svl","ioexceptionclosing");
        }
    }
}
```

```
class Reading implements Parcelable {
    public float acetoneValue;
    public float convertedGlucose;
    String dateS;
    Reading(float aV){
        acetoneValue=aV;
        Date date1=new Date();
        dateS=date1.toString();
        convertedGlucose=this.convertGlucose(acetoneValue);
    }
    public float convertGlucose(float aV){



        return 0;
    }
    @Override
    public int describeContents() {
        return 0;
    }
    @Override
    public void writeToParcel(Parcel dest, int flags) {
        dest.writeString(this.toString());
    }
    public String toString(){
        String a;
        String b=String.format("%f",acetoneValue);
        String c=String.format("%f",convertedGlucose);
        a=(b+" "+c+" "+dateS+"\r\n");
        return a;
    }
    public String toPrintString(){
        String a;
        String b=String.format("%f",acetoneValue);
        String c=String.format("%f",convertedGlucose);
        a=("Acetone Value="+b+" PPM\n\rGlucose Value="+c+" UNITS\n\rDate and
Time="+dateS.substring(4,24));
        return a;
    }
    Reading(String s){
        Log.d("rdg","starting reading with s="+s);
        String a="";
        String b="";
        String c="";
        StringBuilder sb1=new StringBuilder();
        StringBuilder sb2=new StringBuilder();
        StringBuilder sb3=new StringBuilder();
        String adder;
        char a1;
        int sv=0;
        if(s!=""){
            a1=s.charAt(sv);
            for (;a1!=' ';sv++){
                adder=Character.toString(a1);
                sb1.append(adder);
                a1=s.charAt(sv+1);
            }
            sv++;
            a1=s.charAt(sv);
            for (;a1!=' ';sv++){
                adder=Character.toString(a1);
                sb2.append(adder);
```

```
            a1=s.charAt(sv+1);
        }
        sv++;
        a1=s.charAt(sv);
        for (;a1!='\r';sv++){
            adder=Character.toString(a1);
            sb3.append(adder);
            a1=s.charAt(sv+1);
        }
        dateS=sb3.toString();
        acetoneValue=Float.parseFloat(sb1.toString());
        convertedGlucose=Float.parseFloat(sb2.toString());
        sv+=2;
    }else{
        Log.d("reading","reading input null");
    }
}
public static final Parcelable.Creator<Reading> CREATOR = new Parcelable.Creator<Reading>() {
    @Override
    public Reading createFromParcel(Parcel source) {
        return new Reading(source);
    }

    @Override
    public Reading[] newArray(int size) {
        return new Reading[size];
    }
};

public Reading(Parcel data) {
    this(data.readString());
}
}
```

## Related XML File:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="com.noahspenser.seniordesign.MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Menu Options"
        android:layout_alignParentRight="true"
        android:layout_alignParentEnd="true"
        android:layout_alignParentTop="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:id="@+id/textView" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Read From Device"
        android:id="@+id/readbutton"
        android:layout_below="@+id/textView"
```

```
        android:layout_centerHorizontal="true"
        android:layout_marginTop="53dp"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="View Previous Readings"
        android:id="@+id/membutton"
        android:layout_marginTop="32dp"
        android:layout_below="@+id/readbutton"
        android:layout_centerHorizontal="true"/>
</RelativeLayout>
```

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```
// CheckHistory.java ; Noah Spenser; Senior Design; Diabetic Breathalyzer
package com.noahspenser.seniordesign;

import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.ListView;

import java.util.ArrayList;

public class CheckHistory extends AppCompatActivity {
    ListView listview;
    ArrayList<Reading> valueList;
    String[] stringArray;
    ArrayAdapter<String> adapter;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_check_history);
        listview=(ListView) findViewById(R.id.listView);
        Intent i2=this.getIntent();
        valueList=i2.getParcelableArrayListExtra("valueList");
        if(valueList!=null){
            if(valueList.size()>0){
                stringArray=new String[valueList.size()];
                for(int cc=0;cc<valueList.size();cc++){
                    stringArray[cc]=valueList.get(valueList.size()-1-cc).toPrintString();
                }
            }else{
                stringArray=new String[]{"No Previous Values Exist"};
            }
        }else{
            stringArray[0]="No Previous Values Exist";
        }
        adapter=new ArrayAdapter<String>(this,android.R.layout.simple_list_item_1,stringArray);
        listview.setAdapter(adapter);
        final Button button1 = (Button) findViewById(R.id.button2);
        button1.setOnClickListener(new View.OnClickListener() {
            public void onClick(View v) {
                Intent i2=new Intent(CheckHistory.this,MainActivity.class);
                i2.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);
                startActivity(i2);
            }
        });
    }
}
```

Related XML File:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="com.noahspenser.seniordesign.CheckHistory">

    <ListView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/listView"
        android:layout_alignParentTop="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_above="@+id/button2" />

    <Button
        style="?android:attr/buttonStyleSmall"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Return"
        android:id="@+id/button2"
        android:layout_alignParentBottom="true"
        android:layout_centerHorizontal="true"/>
</RelativeLayout>
```

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```
// ReadFromDevice.java ; Noah Spenser; Senior Design; Diabetic Breathalyzer
package com.noahspenser.seniordesign;

import android.bluetooth.BluetoothAdapter;
import android.bluetooth.BluetoothDevice;
import android.bluetooth.BluetoothSocket;
import android.content.Intent;
import android.os.Build;
import android.os.Handler;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.lang.reflect.Method;
import java.util.Set;
import java.util.UUID;
import android.widget.TextView;

public class ReadFromDevice extends AppCompatActivity {
    private static final String TAG = "bluetooth1";
    float readingv;
    final int RecvMsg=1;
    TextView textView3;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

```
    readingv=-1;
    setContentView(R.layout.activity_read_from_device);
    textView3 = (TextView)findViewById(R.id.textView3);
    textView3.setText("Pending Reading...");
    final BluetoothSocket sock1=fromDevice(this.findViewById(android.R.id.content));
    final Button button2 = (Button) findViewById(R.id.button);
    button2.setOnClickListener(new View.OnClickListener() {
       public void onClick(View v) {
          Intent i=new Intent(ReadFromDevice.this, MainActivity.class);
          i.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);
          if(readingv!=-1) {
             i.putExtra("newReading",readingv);
          }
          try{
             sock1.close();
             Log.d("fd","closing bluetooth");
          }catch (IOException abcf){
             Log.d("oc","couldn't close");
          }
          startActivity(i);
       }
    });
}
BluetoothDevice device1=null;
BluetoothAdapter commAdapter=null;
static UUID uuid1;
Handler h;
StringBuilder sb=new StringBuilder();
static String address;
public BluetoothSocket fromDevice(View view){
    commAdapter = BluetoothAdapter.getDefaultAdapter();
    h = new Handler() {
       public void handleMessage(android.os.Message msg) {
          switch (msg.what) {
             case RecvMsg:                                   // if receive message
                byte[] readBuf = (byte[]) msg.obj;
                String strIncom = new String(readBuf, 0, msg.arg1);                 // create string from bytes array
                sb.append(strIncom);//sb.append("435.222\r\n");
                Log.d("rm","got incoming");// append string
                int endOfLineIndex = sb.indexOf("\r\n");
                Log.d("rm","end of line");// determine the end-of-line
                if (endOfLineIndex > 0) {
                   Log.d("rm","foundendofline");// if end-of-line,
                   String sbprint = sb.substring(0, endOfLineIndex);               // extract string
                   sb.delete(0, sb.length());
                   textView3.setText(sbprint);
                   try{
                      readingv=Float.parseFloat(sbprint);
                   }catch(NumberFormatException a){
                      textView3.setText("No Readable Value");
                      readingv=-1;
                   }
                }
                Log.d(TAG, "...String:"+ sb.toString() +  "Byte:" + msg.arg1 + "...");
                break;
             case 0:
                textView3.setText("No Readable Value");
          }
       }
    };
    if (commAdapter == null){
       Log.v("fd","it's null");
```

```
            Intent i=new Intent(ReadFromDevice.this, MainActivity.class);
            i.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);
            startActivity(i);
            finish();
            return null;//I dunno what to tell you man this requires Bluetooth
        }
        int REQUEST_ENABLE_BT=1;
        Log.v("fd","it's still going");
        if (!commAdapter.isEnabled()) {
            Intent enableBtIntent = new Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
            startActivityForResult(enableBtIntent, REQUEST_ENABLE_BT);
        }
        Set<BluetoothDevice> pairedDevices = commAdapter.getBondedDevices(); // If there are paired devices
        if (pairedDevices.size() > 0) { // Loop through paired devices
            for (BluetoothDevice device : pairedDevices) {
                // Add the name and address to an array adapter to show in a ListView
                Log.d("fd","found a device"+device.getAddress());
                if (device.getAddress().equals("98:D3:31:40:49:1E")){
                    Log.d("fd","found the device");
                    device1 = device;
                    uuid1= UUID.fromString("00001101-0000-1000-8000-00805F9B34FB");
                    address=device1.getAddress();
                    break;
                }
            }
        }
        else {
            Log.d("fd","didn't find anything");
            finish(); //need to pair
        }
        BluetoothSocket sock1=null;
        try {
            Log.d("bsc","creating socket for device");
            sock1 = createBluetoothSocket(device1);
        } catch (IOException e1) {
            errorExit("Fatal Error", "In onResume() and socket create failed: " + e1.getMessage() + ".");
        }
        commAdapter.cancelDiscovery();
        Log.d(TAG, "...Connecting...");
        try {
            sock1.connect();
            Log.d(TAG, "....Connection ok...");
        } catch (IOException e) {
            try {
                sock1.close();
                Log.d("cs","closing socket");
            } catch (IOException e2) {
                errorExit("Fatal Error", "In onResume() and unable to close socket during connection failure" +
e2.getMessage() + ".");
            }
        }
        Log.d(TAG, "...Create Socket...");

        ConnectedThread ct1 = new ConnectedThread(sock1);
        ct1.start();
        return sock1;
    }
    private BluetoothSocket createBluetoothSocket(BluetoothDevice device) throws IOException {
        if(Build.VERSION.SDK_INT >= 10&&device.getName()=="HC-05"){
            try {
                final Method m = device.getClass().getMethod("createInsecureRfcommSocketToServiceRecord", new
Class[] { UUID.class });
```

```
            return (BluetoothSocket) m.invoke(device, uuid1);
        } catch (Exception e) {
            Log.e(TAG, "Could not create Insecure RFComm Connection",e);
        }
    }else if(device.getName()!="HC-05"){
        Log.e(TAG,"didn't really pass a device");
    }
    return  device.createRfcommSocketToServiceRecord(uuid1);
}
private void errorExit(String title, String message){
    Toast.makeText(getBaseContext(), title + " - " + message, Toast.LENGTH_LONG).show();
    finish();
}

private class ConnectedThread extends Thread {
    private final InputStream instream1;
    private final OutputStream outstream1;

    public ConnectedThread(BluetoothSocket socket) {
        InputStream tmpIn = null;
        OutputStream tmpOut = null;

        // Get the input and output streams, using temp objects because
        // member streams are final
        try {
            tmpIn = socket.getInputStream();
            tmpOut = socket.getOutputStream();
        } catch (IOException e) { }

        instream1 = tmpIn;
        outstream1 = tmpOut;
    }

    public void run() {
        byte[] buffer = new byte[256];  // buffer store for the stream
        int bytes; // bytes returned from read()

        // Keep listening to the InputStream until an exception occurs
        while (true) {
            try {
                // Read from the InputStream
                bytes = instream1.read(buffer);        // Get number of bytes and message in "buffer"
                h.obtainMessage(RecvMsg, bytes, -1, buffer).sendToTarget();     // Send to message queue Handler
            } catch (IOException e) {
                break;
            }
        }
    }

    /* Call this from the main activity to send data to the remote device */
    public void write(String message) {
        Log.d(TAG, "...Data to send: " + message + "...");
        byte[] msgBuffer = message.getBytes();
        try {
            outstream1.write(msgBuffer);
        } catch (IOException e) {
            Log.d(TAG, "...Error data send: " + e.getMessage() + "...");
        }
    }
}
public void saveReturn(View view){
    Intent i=new Intent(this, MainActivity.class);
```

```
        i.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);
        if(readingv!=-1) {
            i.putExtra("newReading",readingv);
        }
        startActivity(i);
    }
}
```

Related XML File:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical" android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:weightSum="1">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceLarge"
        android:text="Newest Reading Value"
        android:id="@+id/textView2"
        android:layout_gravity="center_horizontal"
        android:layout_weight="0.03"
        android:layout_marginTop="50dp" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceLarge"
        android:text="   "
        android:id="@+id/textView3"
        android:layout_gravity="center_horizontal"
        android:layout_weight="0.03"
        android:layout_marginTop="30dp"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Save Value and Return To Menu"
        android:id="@+id/button"
        android:layout_gravity="center_horizontal"
        android:layout_weight="0.03"
        android:layout_marginTop="100dp"/>
</LinearLayout>
```